Datasheet

SGI™ Video Acquisition and Exploitation System

Features

- Data acquisition and preview in real time
- Real-time playback of captured video
- Nonlinear video editing
- Pan, zoom, and rotate plus contrast and brightness adjustments
- Tracking of selected pixels through a video stream
- Overlays of diagrams, pointers, or annotations on video
- Deblurring of images from unstable cameras
- Uncompressed I/O of NTSC, CCIR 601, ITU-R 601, or HD video

Intelligence Products from Real-Time Video Streams

Agencies that have long relied on static digital images to derive intelligence products are now processing full-motion video from a variety of sources. Video from unmanned aerial vehicles (UAVs), handheld cameras, surveillance aircraft, or seagoing vessels offers a dynamic view of still or moving subjects that can provide another level of intelligence information. The challenge for defense and intelligence agencies is to transform these real-time video inputs into useful intelligence products. The SGI Video Acquisition and Exploitation System (VAES) combines industry-leading video and graphics technology to deliver a compact, powerful video processing solution. The VAES consists entirely of commercial off-the-shelf hardware and software components.

Video Acquisition: Capturing a Variety of Formats in Real Time

The Silicon Graphics® Onyx2® visualization supercomputer gives the VAES the bandwidth to collect and preview uncompressed video in real time from a variety of sources. A Silicon Graphics® DIVO board processes digital video from NTSC or PAL inputs (CCIR-601), including real-time inputs such as microwave or satellite downlinks and tapes from handheld video cameras. A Silicon Graphics HD I/O board processes HD video in 1920x1080i or 1280x720p format for customers that are demanding the higher resolution and image quality of HDTV.

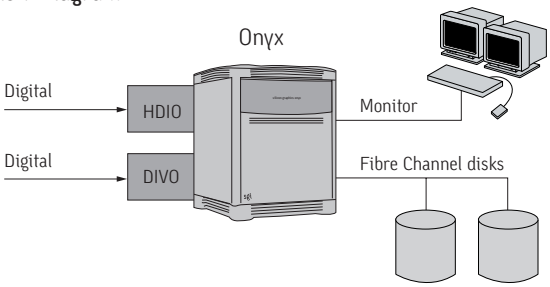
The highly scalable architecture and Fibre Channel RAID capacity of the Onyx2 system easily handle terabyte-size databases. Onyx2 processing power is scalable up to 128 processors to handle the most demanding video acquisition and processing tasks. The VAES can be ruggedized for field operations, permitting acquisition of video near the action for on-the-spot exploitation or transmission elsewhere for secondary exploitation.

Video Exploitation: Full Video Editing Capability

The Alias|Wavefront division of SGI has adapted the interface of its industry-leading Maya® Composer software package, widely used by video industry professionals, with plug-ins for the special needs of intelligence gathering. The VAES interface permits analysts to acquire video inputs through DIVO and HD I/O boards. Another modification, useful for intelligence work or the creation of training videos, enables tracking of selected pixels through the video stream to show change or movement in identified subjects.

The result is an off-the-shelf, nonlinear video editor, fully supported by Alias|Wavefront and SGI, with all the functionality and productivity of an electronic light table. Analysts move quickly through captured video using real-time playback of captured video from disk, with real-time pan and zoom. They can use real-time preview and nonlinear editing to accelerate analysis and presentation. Pan, zoom, and rotate functions enable them to locate subjects of interest. They can adjust contrast and brightness to increase clarity. Images that are blurred by camera movement can be stabilized for analysis. Analysts can annotate their findings with graphics indicators and text notes, delineating subjects and adding comments or recommendations.

Configuration Diagram



The VAES: Powerful, Practical, and Cost-Effective

The SGI VAES adds a new dimension to intelligence gathering. Customers can now use fully supported COTS systems, modified to serve the needs of the intelligence community, to acquire and process uncompressed video in real time with a highly sophisticated video editor. As use of UAVs for surveillance and intelligence gathering grows and agencies expand information gathering through handheld cameras in many environments, the VAES will become ever more valuable. Its use of commercial off-the-shelf hardware and software makes it practical and serviceable, particularly in remote or unfavorable locations. Its superb video editing interface permits analysts to react more quickly and positively to developing situations. And the unequalled scalability of Onyx2 makes the VAES expandable to handle virtually any load in a cost-effective way.

Video exploited in Maya Composer

SGI Video Acquisition and Exploitation System Technical Specifications

Onyx2 Deskside
- 2 to 4 R12000™ Processors
- 2 to 8 display channels
- VGA to HDTV display capability
- Exabyte capable filesystem
- 4 XIO Expansion slots

Digital Video Option (DIVO)
- Supports 2 simultaneous digital video channels
- 8- or 10-bit digital video in SMPTE 259M or SMPTE 272M formats
- Real-time color space conversions between YUV and RGB
- Lossless data mode using Rice entropy encoding

HD I/O (XT-HDIO)
- Supports real-time input and output in SMPTE 274M, SMPTE 260M, SMPTE 269M, and ITU-R BT.709 video formats
- 10 HDTV timings (including 720p, 1080i, and 1080 24p)
- Real-time transparent color space conversion
- 8-, 10-, and 12-bit support
- Dual-link 4444 RGBA or 444YUVA I/O

Alias|Wavefront™ Maya Composer
- Industry-leading compositing and special effects solution
- Interactive FlowGraph user interface
- True Track motion tracking system
- API allows customers to create custom plug-ins

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